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It's a mast, mast year for white spruce

by Sarah Locke

A drive down the Atlin Road these days reveals sweeps of alarmingly brown forest. At first glance it looks as though large numbers of spruce trees are dying or already dead. A closer inspection reveals that the brown is produced by huge masses of cones, so thick that they obscure the branches in places.

The trees are producing what is known as mast, a bumper crop of cones which occurs every five to seven years on white spruce in this part of the world. And while mast years are part of a natural cycle, excessively luxuriant cone crops can indicate that certain trees might not be feeling 100 percent healthy this season.

White spruce in the Yukon are producing a bumper crop of cones this year.
(photo: Theresa Gulliver, CPAWS-Yukon)

"Trees are amazing," says Susan Skaalid, the manager of Forest Operations with the Yukon's Forest Management Branch. "If their systems are under stress and it looks like they are going to perish, they will focus their energy on getting their seeds out to propagate."

Skaalid says any number of factors can stress a tree, but hot, dry weather in May and June of 2004 no doubt made life tougher in the forests. While humans might enjoy warm dry weather, the Yukon's trees can take only so much of it.

"When a tree undergoes that type of stress, the response can be to put out a heavier crop of cones the following year," she says.

Trees need lots of water -- both to grow and to replace the water that they lose through pores in their needles -- a process called transpiration that Skaalid likens to sweating.

"Trees are dormant through the winter months, and then they wait for the perfect combination of light, temperature and moisture to get physiological activity going

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again, and one of the key components is a need for water," explains Skaalid.

Some species such as aspen and balsam poplar have trees of different sexes, but on white spruce, the female and male cones live on the same trees. While the small male pollen cones can be hard to see, the larger female seed cones hanging from the branches are prominent -- and fortunately trees have no false modesty.

"Aren't you glad that you do not produce a cone crop when you are stressed?" queries Skaalid.

Mast years are part of a forest's ongoing strategy to ensure its own survival. Foresters always track these events, using them to help with their efforts to maintain healthy forests. "We take advantage of these mast years to collect as much seed as possible from as many locations as possible," says Skaalid.

After forestry staff in the district offices collect cones from their areas, the cones are sent to a seed repository located in Prince Albert, Saskatchewan. The seeds are cleaned and stored until they are needed for replanting.

"We want trees from Yukon genetic sources for replanting," says Skaalid. "Reforestation and monitoring can be an expensive process, and it is essential to make sure that we get the best possible success rate after timber harvesting activities."

The seeds are also labelled carefully with the latitude, longitude and elevation of where they were collected, as there are strict criteria as to how far away the seedlings can be replanted from their original homes.

Seeds have been collected during mast years in the Yukon for decades. Skaalid says that factors such as climate change, extreme fire seasons and infestations of spruce bark beetles could make having seeds in the bank even more important in the future.

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